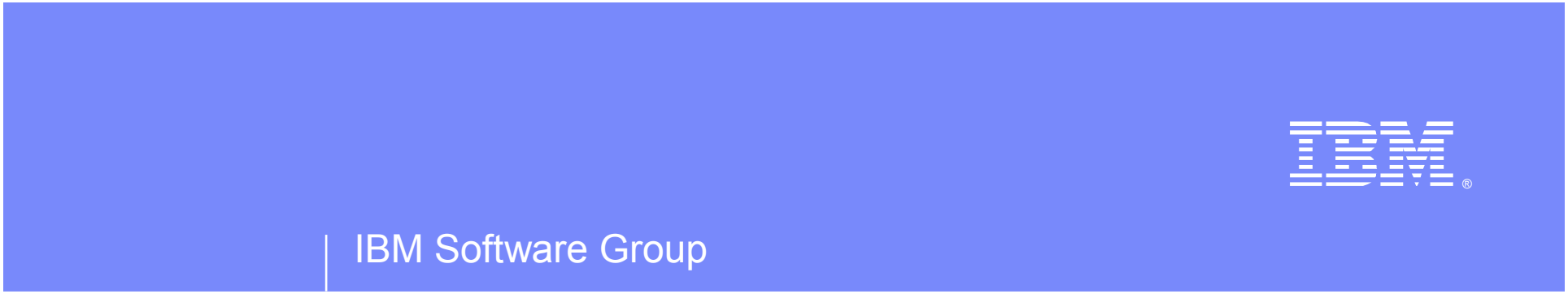

Down and Dirty: Unraveling root cause of hangs and waits in CICS

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Agenda

- A request for when you take dumps of a hang or slowdown.
- Three different types of CICS hangs.
- Steps for analyzing a dump taken while CICS is hung.
- How to figure out what the application program last did.

The best way to take a dump

- Don't use CICS to take the dump.
  - It messes up some clues about what CICS was doing before you started taking the dump.
- Take a COMM dump through the console.
- The rest of this presentation assumes the dump was not taken by CICS.
- Here are some links to a couple of 'must gather' technotes. The COMM dump syntax is in there:

MustGather Read first -
http://www.ibm.com/support/docview.wss?rs=1083&uid=swg21208053

MustGather Wait or loop -
http://www.ibm.com/support/docview.wss?rs=1083&uid=swg21214981

Three different types of CICS hangs

- CICS is unhealthy – tasks are dispatchable but the dispatcher never gets control so it can dispatch tasks.
- CICS is healthy but there are no dispatchable tasks. They are all suspended on some resource.
- CICS is healthy but there are no user tasks at all.

CICS is unhealthy

- On each TCB, CICS dispatcher gives control to one task at a time.
- When this running task does something to cause the task to suspend, that causes control to return back to the CICS dispatcher so that another task can be dispatched.
- If the running task gets stuck doing something and never does anything to give control back to the CICS dispatcher, no other tasks can use that TCB.
- The CICS dispatcher has lost control.

CICS is healthy, but tasks are stuck

- The CICS dispatcher is getting control, but none of the user tasks are dispatchable.
- The user tasks are all or mostly all suspended on some CICS resource like FCIOWAITs or ALLOCATE waits.

CICS is healthy but there are no tasks

- The system that sends work to this CICS region has stopped sending work.
- Something is wrong with one of the CICS system tasks that receive new work.

Is CICS healthy?

- On a healthy busy CICS region, CICS dispatches tasks on the QR TCB frequently.
- So if the time the last task was dispatched on QR is a long time prior to dump time, CICS is not healthy.

What time was the dump taken:

- Do systrace all
- Max to the bottom
- Copy the bottom STCK timestamp
- Do ip ltod xxxxxxxxxxxxxxxx where xxx is the copied timestamp

```
Enter a free-form IPCS subcommand or a CLIST or REXX exec invocation below:

===> systrace all
---------------------- IPCS Subcommands and Abbreviations --------------------
ADDDUMP             | DROPDUMP, DROPD    | LISTDUMP, LDMP     | RENUM,     REN
ANALYZE             | DROPMAP,  DROPM    | LISTMAP,  LMAP     | RUNCHAIN, RUNC
ARCHECK             | DROPSYM,  DROPS    | LISTSYM,  LSYM     | SCAN
ASCBEXIT, ASCBX     | EPTRACE            | LISTUCB,  LISTU    | SELECT
ASMCHECK, ASMK      | EQUATE,   EQU, EQ  | LITERAL            | SETDEF,    SETD
CBFORMAT, CBF       | FIND,     F        | LPAMAP             | STACK
CBSTAT              | FINDMOD,  FMOD     | MERGE              | STATUS,    ST
CLOSE               | FINDUCB,  FINDU    | NAME               | SUMMARY,   SUMM
COPYDDIR            | GTFTRACE, GTF      | NAMETOKN           | SYSTRACE
COPYDUMP            | INTEGER            | NOTE,     N        | TCBEXIT,   TCBX
COPYTRC             | IPCS HELP, H       | OPEN               | VERBEXIT, VERBX
CTRACE              | LIST,     L        | PROFILE,  PROF     | WHERE,     W


 F1=HELP     F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=MORE     F7=UP
 F8=DOWN     F9=SWAP    F10=LEFT    F11=RIGHT   F12=CURSOR
```

```
A52E1300  80C04007 0FFFAE60 0C000001  00000080 00000000 00DB 00DC C3F90D3A7445ACF2
                   0259CDC0 00400019  00000000
                                                          00DC
                                                          00DC
                                                          00DC
                                                          00DC
                                                          00DC
                                                          00DC
1D1EACBA             05200
1D1EACD8           00DB
                                                          00DC
9D3E396C  00C04007 0FFF8E50 0C000000  00000080 00000000 00DB 00DC C3F90D3A7448FEE0
                   02495C48 00400003  00000000
A4F8953A  00041201 40800000 1AD4E8B0  00000000 00000000 00DB 00DC C3F90D3A744E5ECC
          814D34B0                    00000000
014D35B2             00503            SysTrace Processor Snap
00000000  00041201 40800000 1AD4E8B0  00000000 00000000 0001 000  C3F90D3A74841204
          814D34B0                    00000000
014D35B2             00503            SysTrace Processor Snap
****************** END OF DATA ***********************************************
```

ip ltod C3F90D3A74841204

```
********************************************************** TOP OF DATA *
      04/01/2009 16:09:39.323969 STCK    X'C3F90D3A 74841204'
      04/01/2009 16:09:18.323969 UTC     X'C3F90D26 6D901204'
      04/01/2009 12:09:18.323969 LOCAL   X'C3F8D781 84901204'
********************************************************** END OF DATA *
```

- **Formatted STCK needed for Dispatcher Formatter**
- **Local time needed for most everything else**

When was the last task dispatched on the QR TCB?

- Do verbx dfhpd650 ‘csa=2’
- CSA +X’50’ is updated each time a task is dispatched on the QR TCB
- It is also updated on each EXEC CICS ASKTIME
- It is a packed 4-byte field of the format HHMMSSTF
- 1203425F means 12:03:42.5

Dump Time and CSA Time for main dump

```
06/16/2008 18:07:00.220259 STCK   X'C28DCC72 F7563360'
06/16/2008 18:07:00.220259 UTC    X'C28DCC72 F7563360'
06/16/2008 13:07:00.220259 LOCAL  X'C28D8964 D4163360'
```

CSA+x'50' is 1303013F or 13:03:01.3

What do we know so far?

- If CSA time is real close to local dump time, then the CICS QR TCB is probably dispatching tasks in a normal manner. Probably the problem is that the user tasks are suspended on some CICS resource.
- If CSA time is much earlier than dump time, probably some task is not letting go of the QR TCB.
- The Dispatcher formatter will further clarify things.
- Verbx dfhpd650 'ds=3'

Things to notice in the Dispatcher Summary

- Time of Suspend
  - In STCK time, not adjusted for timezone or leap seconds.
  - Is Time of Suspend on the user tasks a long time prior to STCK time of dump?

Things to notice in the Dispatcher Summary

- State of Task
  - D=DISPATCHABLE Waiting to run. Waiting to be dispatched.
  - S=SUSPENDED Suspended on something.
  - R=RUNNING and A=RUNNING ABTERM YES and J=RUNNING IN JVM In control of the TCB.

Things to notice in the Dispatcher Summary

- Task Mode (M)
  - The mode of TCB the task is running on or waiting for or suspended on.

```
T S F P TT RESOURCE RESOURCE_NAME    W TIME OF      TIMEOUT      DTA      AD ATTACHER M SUSPAREA XM_TXN_TOKEN
           TYPE                        SUSPEND      DUE          (DSTSK)     TOKEN

N S I N -  XM-PAREN ....            S 15:24:54.093      -       242DC200 XM 3EC7A1B8 QR 242DC200 3EC7A1B80089376C
N S I N -  XM-PAREN ....            S 14:43:40.401      -       242DC380 XM 2E28C4C8 QR 242DC380 2E28C4C80089197C
N S I N -  ENQUEUE  FCDSRECD        S 14:49:37.545      -       242DC500 XM 3EF9CC70 QR 242DC500 3EF9CC700089303C
N S I N DD USERWAIT TH13TCP         M 16:09:39.300 16:14:39.300 242DC680 XM 2E28CC70 QR 250C6B33 2E28CC700037401C
N S I N -  XM-PAREN ....            S 15:25:08.674      -       242DC800 XM 3EED2340 QR 242DC800 3EED23400089387C
N S I N -  XM-PAREN ....            S 14:48:11.813      -       242DCB00 XM 2E28C7D8 QR 242DCB00 2E28C7D80089323C
N S I N -  ENQUEUE  FCDSRECD        S 15:27:44.586      -       242DCC80 XM 3F0E77D8 QR 242DCC80 3F0E77D80089430C
N S I N -  XM-PAREN ....            S 14:43:49.633      -       242DCE00 XM 2E28C1B8 QR 242DCE00 2E28C1B80089204C
N S I N -  XM-PAREN ....            S 14:48:11.821      -       242DD080 XM 3F015030 QR 242DD080 3F0150300089339C
N S I N -  ENQUEUE  FCDSRECD        S 14:45:36.240      -       242DD200 XM 3EE53960 QR 242DD200 3EE539600089190C
```

- **State of Task: All suspended**

```
T S F P TT RESOURCE RESOURCE_NAME    I TIME OF      TIMEOUT      DTA      AD ATTACHER M SUSPAREA XM_TXN_TOKEN
           TYPE                      SUSPEND      DUE          (DSTSK)     TOKEN

N S N N -  XM-PAREN ....             S 15:24:54.093     -        242DC200 XM 3EC7A1B8 QR 242DC200 3EC7A1B80089376C
N S N N -  XM-PAREN ....             S 14:43:40.401     -        242DC380 XM 2E28C4C8 QR 242DC380 2E28C4C80089197C
N S P N -  ENQUEUE  FCDSRECD         S 14:49:37.545     -        242DC500 XM 3EF9CC70 QR 242DC500 3EF9CC700089303C
N S P N DD USERWAIT TH13TCP          M 16:09:39.300 16:14:39.300 242DC680 XM 2E28CC70 QR 250C6B33 2E28CC700037401C
N S N N -  XM-PAREN ....             S 15:25:08.674     -        242DC800 XM 3EED2340 QR 242DC800 3EED23400089387C
N S N N -  XM-PAREN ....             S 14:48:11.813     -        242DCB00 XM 2E28C7D8 QR 242DCB00 2E28C7D80089323C
N S P N -  ENQUEUE  FCDSRECD         S 15:27:44.586     -        242DCC80 XM 3F0E77D8 QR 242DCC80 3F0E77D80089430C
N S N N -  XM-PAREN ....             S 14:43:49.633     -        242DCE00 XM 2E28C1B8 QR 242DCE00 2E28C1B80089204C
N S N N -  XM-PAREN ....             S 14:48:11.821     -        242DD080 XM 3F015030 QR 242DD080 3F0150300089339C
N S P N -  ENQUEUE  FCDSRECD         S 14:45:36.240     -        242DD200 XM 3EE53960 QR 242DD200 3EE539600089190C
```

- **Time of Suspend**

T	S	F	P	TT	RESOURCE TYPE	RESOURCE_NAME	W	TIME OF SUSPEND	TIMEOUT DUE	DTA (DSTSK)	AD	ATTACHER TOKEN	M	SUSPAREA	XM_TXN_TOKEN
N	S	N	N	-	XM-PAREN	....	S	15:24:54.093	-	242DC200	XM	3EC7A1B8	QR	242DC200	3EC7A1B8 00089376C
N	S	N	N	-	XM-PAREN	....	S	14:43:40.401	-	242DC380	XM	2E28C4C8	QR	242DC380	2E28C4C 0089197C
N	S	P	N	-	ENQUEUE	FCDSRECD	S	14:49:37.545	-	242DC500	XM	3EF9CC7	QR	242DC500	3EF9CC7 00089303C
N	S	P	N	DD	USERWAIT	TH13TCP	M	16:09:39.300	16:14:39.300	242DC680	XM	2E28CC7	QR	250C6B33	2E28CC7 00037401C
N	S	N	N	-	XM-PAREN	....	S	15:25:08.674	-	242DC800	XM	3EED234	QR	242DC800	3EED234 00089387C
N	S	N	N	-	XM-PAREN	....	S	14:48:11.813	-	242DCB00	XM	2E28C7D8	QR	242DCB00	2E28C7D 80089323C
N	S	P	N	-	ENQUEUE	FCDSRECD	S	15:27:44.586	-	242DCC80	XM	3F0E77D8	QR	242DCC80	3F0E77D 80089430C
N	S	N	N	-	XM-PAREN	....	S	14:43:49.633	-	242DCE00	XM	2E28C1B8	QR	242DCE00	2E28C1B 80089204C
N	S	N	N	-	XM-PAREN	....	S	14:48:11.821	-	242DD080	XM	3F015030	QR	242DD080	3F01503 0089339C
N	S	P	N	-	ENQUEUE	FCDSRECD	S	14:45:36.240	-	242DD200	XM	3EE53960	QR	242DD200	3EE5396 00891900

- **Task Mode: QR**
- **Task number**

```
T S F P TT RESOURCE RESOURCE_NAME     W TIME OF       TIMEOUT       DTA       AD ATTACHER M SUSPAREA XM_TXN_TOKEN
           TYPE                       SUSPEND       DUE           (DSTSK)      TOKEN

S S N N -  ENF      NOTIFY            M 12:04:43.630      -       17E9B080 DM 17F76980 RO 17F76998
S R                                                               17E9B500 AP 80050A18 CQ
N D                                                               17EA8080 XM 1E3B5960 QR          1E3B59600068513C
N D                                                               17EA8380 XM 1E7CB4C8 QR          1E7CB4C80068387C
N D                                                               17EA9080 XM 1E0E14C8 QR          1E0E14C80068704C
N D                                                               17EA9200 XM 1E0E1C70 QR          1E0E1C700067930C
N D                                                               17EA9380 XM 1E3B7C70 QR          1E3B7C700068769C
N D                                                               17EA9500 XM 1E3B7340 QR          1E3B73400068780C
N D                                                               17EAA080 XM 1E3871B8 QR          1E3871B80068755C
N D                                                               17EAA380 XM 1E0E1030 QR          1E0E10300068729C
N D                                                               17ED8380 XM 1E387AE8 QR          1E387AE80068682C
N D                                                               17ED8500 XM 1E3B77D8 QR          1E3B77D80068665C
N D                                                               17ED8800 XM 1E7CBAE8 QR          1E7CBAE80068234C
N D                                                               17ED8C80 XM 1E7CBDF8 QR          1E7CBDF80068216C
N R                                                               17ED9080 XM 1E7E6AE8 QR          1E7E6AE80068778C
```

- **Running on the CQ. That is normal.**

```
T S F P TT RESOURCE RESOURCE_NAME     W TIME OF       TIMEOUT       DTA       AD ATTACHER M SUSPAREA XM_TXN_TOKEN
           TYPE                       SUSPEND       DUE           (DSTSK)       TOKEN

S S N N -  ENF      NOTIFY            M 12:04:43.630      -       17E9B080 DM 17F76980 RO 17F76998
S R                                                               17E9B500 AP 80050A18 CQ
N D                                                               17EA8080 XM 1E3B5960 QR          1E3B59600068513C
N D                                                               17EA8380 XM 1E7CB4C8 QR          1E7CB4C80068387C
N D                                                               17EA9080 XM 1E0E14C8 QR          1E0E14C80068704C
N D                                                               17EA9200 XM 1E0E1C70 QR          1E0E1C700067930C
N D                                                               17EA9380 XM 1E3B7C70 QR          1E3B7C700068769C
N D                                                               17EA9500 XM 1E3B7340 QR          1E3B73400068780C
N D                                                               17EAA080 XM 1E3871B8 QR          1E3871B80068755C
N D                                                               17EAA380 XM 1E0E1030 QR          1E0E10300068729C
N D                                                               17ED8380 XM 1E387AE8 QR          1E387AE80068682C
N D                                                               17ED8500 XM 1E3B77D8 QR          1E3B77D80068665C
N D                                                               17ED8800 XM 1E7CBAE8 QR          1E7CBAE80068234C
N D                                                               17ED8C80 XM 1E7CBDF8 QR          1E7CBDF80068216C
N R                                                               17ED9080 XM 1E7E6AE8 QR          1E7E6AE80068778C
```

- **Task 68778 is Running on the QR with other tasks Dispatchable on the QR. How long has that existed?**

```
T S F P TT RESOURCE RESOURCE_NAME     W TIME OF      TIMEOUT      DTA      AD ATTACHER M SUSPAREA XM_TXN_TOKEN
           TYPE                       SUSPEND      DUE          (DSTSK)     TOKEN

N R                                                              17ED9080 XM 1E7E6AE8 QR          1E7E6AE80068778C
```

- Find on ‘DTA 17ED9080’

```
DTA 17ED9080 DISPATCHER TASK AREA

   0000  FFFFFFFF 0500B053 17ED9080 0500B053  C1D9D8F1 40404040 40404040 C4E2E3E2
   0020  D2C4C5C6 00000000 FE000000 17ED9680  FFFFFFFF 00000000 FFFFFFFF FFFFFFFF
   0040  80000000 02FF0000 DFFFFFFF 3120FAE1  C28DCB8F 369E8E06 C28DCB8F 37AF37C6
   0060  0000E660 18ACE080 01021032 00000000  19E959E0 04010103 17F03030 18AD1BD8
   0080  1E7E6AE8 0068778C C28DC804 A6E66A84  FFFF061A 80000000 C2888C38 811E194B
   00A0  00000000 00000015 00000003 1E7E6AE8  00000000 00000000 00000000 00000000
   00C0  B0530000 00000000 FFFFFFFF FFFFFFFF  C28DC25B 00000000 00000000 00000000
   00E0  00000000 00000000 00C73944 00000000  00000000 00000000 00000000 00000000
   0100  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
   0120  00000000 00000000 00000000 18AD1BD8  19E83030 00000000 00000000 00000000
   0140  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
   0160  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
```

For a running task, DTA+X'58' is effectively the time the task was dispatched.

```
DTA 17ED9080 DISPATCHER TASK AREA

   0000  FFFFFFFF 0500B053 17ED9080 0500B053  C1D9D8F1 40404040 40404040 C4E2E3E2
   0020  D2C4C5C6 00000000 FE000000 17ED9680  FFFFFFFF 00000000 FFFFFFFF FFFFFFFF
   0040  80000000 02FF0000 DFFFFFFF 3120FAE1  C28DCB8F 369E8E06 C28DCB8F 37AF37C6
   0060  0000E660 18ACE080 01021032 00000000  19E959E0 04010103 17F03030 18AD1BD8
   0080  1E7E6AE8 0068778C C28DC804 A6E66A84  FFFF061A 80000000 C2888C38 811E194B
   00A0  00000000 00000015 00000003 1E7E6AE8  00000000 00000000 00000000 00000000
   00C0  B0530000 00000000 FFFFFFFF FFFFFFFF  C28DC25B 00000000 00000000 00000000
   00E0  00000000 00000000 00C73944 00000000  00000000 00000000 00000000 00000000
   0100  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
   0120  00000000 00000000 00000000 18AD1BD8  19E83030 00000000 00000000 00000000
   0140  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
   0160  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000
```

ip ltod C28DCB8F37AF37C6

```
06/16/2008 18:03:01.408499 STCK   X'C28DCB8F 37AF37C6'
06/16/2008 18:03:01.408499 UTC    X'C28DCB8F 37AF37C6'
06/16/2008 13:03:01.408499 LOCAL  X'C28D8881 146F37C6'
```

What do we know so far?

- Task 68778 has been running on the QR TCB since 13:03:01 local time.
- So since then up until dump time, 13:07:00, no other task has been able to run on the QR TCB.
- That is why this CICS region is hung.
- What has that task been doing on the QR ?

What is the QR doing now, at dump time

- Usually, what it is doing at dump time, is what it has been doing for the entire duration of the hang.
- Has the QR TCB been looping for the duration of the hang, or has it been waiting for something.
- The MVS system trace can help us answer that question.

Use the system trace

- Do verbx dfhpdxxx ‘tr=2’
- Near the top, find the ASID for this CICS region

```
-- DFHPD0121I FORMATTING CONTROL BLOCKS FOR JOB PRODCICS
ADDRESS SPACE ASID NUMBER (HEX) = 00DF
```

Use the system trace

- Find the address of the QR TCB by doing a find on the characters -qr

```
TASK-68778 KE_NUM-0035 TCB-QR    /008F8360 RET-
```

Use the system trace

- Do systrace asid(x'aaaa') tcb(x'tttttttt') time(local) using the asid and tcb address noted previously.
- Systrace asid(x'00DF') tcb(x'008F8360').time(local)
- If there is no activity in the system trace for that TCB and ASID, it looks like this:

```
------------------------------------------------- SYSTEM TRACE TABLE
--                                                ------------------
******** TRACE DATA IS NOT AVAILABLE FROM ALL PROCESSORS BEFORE THIS TIME.
******** TRACE DATA IS NOT AVAILABLE FROM ALL PROCESSORS AFTER THIS TIME.
******** NO TRACE TABLE ENTRIES MEETING THE SELECTION CRITERIA WERE FOUND.
```

Use the system trace

- If there is a tight loop going on, the system trace would look something like this:

```
06 0148 00AEB5D8  EXT   1005 078D0000 929888E2  00001005
06 0148 00AEB5D8  I/O  00458 078D2000 929888E6  80C04007
06 0148 00AEB5D8  EXT   1005 078D0000 929888EE  00001005
06 0148 00AEB5D8  I/O  034D4 078D2000 929888EA  00404007
06 0148 00AEB5D8  EXT   1005 078D0000 929888EE  00001005
06 0148 00AEB5D8  I/O  03DF2 078D0000 929888E2  80C04007
06 0148 00AEB5D8  EXT   1005 078D0000 929888EE  00001005
06 0148 00AEB5D8  CLKC       078D0000 929888E2  00001004
06 0148 00AEB5D8  DSP        078D0000 929888E2  00000000
06 0148 00AEB5D8  I/O  0045A 078D2000 929888E6  80C04007
```

Use the system trace

- In the case of a loop, you would next find the program at the PSW address shown in the loop trace entries.
- Do ip where 129888E2 asid(x'148')
- If that doesn't show the name of the program, go to browse mode, go to that address, and back up to find the module header.

Use Summ Format

- In the case where we found no system trace entries for the QR TCB in the system trace, that suggests the QR TCB is in a wait somewhere.
- We need to do a Summ Format command to format the QR TCB and its RBs in order to find the PSW and Regs at time of the wait.
- Using the ASID and TCB address we already got, do summ format asid(x'df')
- Then find on the TCB address like this:
- F 'TCB: 008F8360'

Use Summ Format

- At the TCB, save the general purpose registers.
- Note the RBP address.

```
TCB: 008F8360
   +0000  RBP.....  008FDBC0  PIE......  0000AEA0  DE
   +0018  MSS......  7F5C81D8  PKF......  80        FL
   +0024  LLS......  008AD070  JLB......  008FCD80  JP

   General purpose register values
     0-3   00000001  1720521C  7EFC6500  01000030
     4-7   000C28DC  B8F36DA9  00000200  7E7A3F50
     8-11  17205208  17205000  9727832E  17278FD8
    12-15  97277FD8  7E7A4A20  40000000  808FDBC0
```

Use Summ Format

- Find the RBP address like this: f ‘rb: 008FDBC0’
- That takes you to the top RB.

```
SVRB: 008FDBC0

   -0020  XSB..... 7FFFAE50  FLAGS2... 80        RTPSW1... 00000000  00000000
RTPSW2... 00000000  00000000

   -0008  FLAGS1... 42800049  WLIC..... 00020001

   +0000  RSV..... 00000000  00000000           SZSTAB... 001ED022  CDE..... 00000000
OPSW..... 073C1000  97278362

   +0018  Q....... 00000000  LINK..... 018FD6E8
```

If the 1st byte of LINK is 01 and the OPSW address – 2 is 0A01, then the OPSW address points into the program that put the QR TCB into a wait.

Find the program that waited the QR TCB

- Take that OPSW address, 97278362, and subtract off the high-order 80000000 leaving 17278362.
- Do a ip w 17278362 asid(x'df')
- If that can't determine the program name, go in browse mode to the OPSW address and back up till you find a program header.
- Backing up shows the program PROG003X.

How did control get to PROG003X ?

- Use the CICS Program Domain formatter.

Verbx dfhpdxxx ‘pg=1’

- The PLCB summary for the task shows the calling sequence for the application programs and any GLUEs or TRUEs currently invoked.
- Find on ‘TRAN NUM : xxxxx’ where xxxxx is the task number.
- Under that see the TASK PLCB SUMMARY

```
==PG: PTA SUMMARY FOR TRAN NUM : 68778    PTA ADDRESS : 17FFA858
LOG-LVL : 3          SYS-LVL : 0          TASK-LLE : 18E60860  PLCB : 18AD4840
=PG: TASK LLE SUMMARY
LLE-ADDR     PROGRAM      PPTE-ADD
18E60860     PROGAAZZ     19E04138
=PG: TASK PLCB SUMMARY
PROG PROG0003 LVL   3 PLCB 18AD4840 LD 193F5350 ENT 993F5390 LEN 000C60 PPTE 18E12030 ENV EXEC INV PROG002B
  COMMAREA 19F687F8 LEN 0472
PROG PROG0002 LVL   2 PLCB 18AD26B0 LD 1C6DB280 ENT 9C6DB6D0 LEN 002008 PPTE 19E04B30 ENV EXEC INV PROG0001
  COMMAREA 19F5EDA8 LEN 0036
PROG PROG0001 LVL   1 PLCB 18AD0670 LD 19DA0250 ENT 99DA06A0 LEN 0147F0 PPTE 19E04030 ENV EXEC INV CICS
```

- In this example, the 1st program, PROG0001, has linked to PROG0002 which has linked to PROG002B which has XCTL'd to PROG0003.
- At time of dump PROG0003 is in control, although it could have invoked some non-CICS service without CICS knowing about it.

Verbx dfhpdxxx ‘tr=2’

- If you are lucky, there will be some trace entries for this task, and they might even reach back in time to 13:03:01 when the task was dispatched.
- It is possible that the task is looping making CICS calls since being dispatched at 13:03:01.
- Or perhaps there are no trace entries until right around the beginning of the hang.
- Max to the bottom and find previous on –QR .
- The latest trace entry for task 68778 on the QR TCB is at 13:03:01.

```
68778 QR    AP 00E1 EIP   ENTRY XCTL                                    REQ(0004) FIELD-A(000FEC58 ....) FIELD-B(09000E04 ....)
                                                                                 RET-800B9348 13:03:01.4047139545 00.0000055625 =001033
68778 QR    AP 1941 APLI  EXIT  START_PROGRAM/OK ABEND_CODE() IGNORE_PENDING_XCTL(NO)  Program_name(PROG002B)
                                                                                 RET-981916C8 13:03:01.4047200483 00.0000060937 =001034
68778 QR    AP 1940 APLI  ENTRY START_PROGRAM PROGRAM(PROG0003) CEDF_STATUS(NOCEDF) EXECUTION_SET(FULLAPI) ENVIRONMENT_TYPE(EXEC)
                          SYNCONRETURN(NO) LANGUAGE_BLOCK(1B0FE4F8) COMMAREA(19F687F8 , 00000472) LINK_LEVEL(3)
                          SYSEIB_REQUEST(NO)                             RET-981916C8 13:03:01.4047214233 00.0000013750 =001035
68778 QR    AP 00E1 EIP   ENTRY GETMAIN                                  REQ(0004) FIELD-A(00232358 ....) FIELD-B(08000C02 ....)
                                                                                 RET-993F5454 13:03:01.4047528452 00.0000314218 =001036
68778 QR    AP 00E1 EIP   EXIT  GETMAIN OK                               REQ(00F4) FIELD-A(00000000 ....) FIELD-B(00000C02 ....)
                                                                                 RET-993F5454 13:03:01.4047566420 00.0000037968 =001037
68778 QR    AP 00E1 EIP   ENTRY ASSIGN                                   REQ(0004) FIELD-A(00232358 ....) FIELD-B(08000208 ....)
                                                                                 RET-993F5482 13:03:01.4047578139 00.0000011718 =001038
68778 QR    AP 00E1 EIP   EXIT  ASSIGN OK                                REQ(00F4) FIELD-A(00000000 ....) FIELD-B(00000208 ....)
                                                                                 RET-993F5482 13:03:01.4047606264 00.0000028125 =001039
68778 QR    AP 00E1 EIP   ENTRY ADDRESS                                  REQ(0004) FIELD-A(00232358 ....) FIELD-B(08000202 ....)
                                                                                 RET-993F5958 13:03:01.4047618764 00.0000012500 =001040
68778 QR    AP 00E1 EIP   EXIT  ADDRESS OK                               REQ(00F4) FIELD-A(00000000 ....) FIELD-B(00000202 ....)
                                                                                 RET-993F5958 13:03:01.4047640952 00.0000022187 =001041
```

Verbx dfhpdxxx ‘tr=2’

- So there were no CICS services, and therefore no CICS trace entries, during the hang.
- Task 68778 used CICS services to get to PROG0003.
- Somehow without CICS services control got to PROG003X which issued the operating system wait for some reason. That hangs CICS.
- You would need to investigate PROG003X to understand what that wait is all about.

Summary:

- Find the time of dump, both formatted STCK (for use in DS=3) and Local (for use everywhere else.)
- Find the last time task was dispatched on the QR from CSA+X'50'.
- Note how far apart those times are.
- Armed with those times, look at Dispatcher Summary and at trace.
- If a task has been running on the QR for a long time but is not making CICS trace entries, use Systrace and Summ format to investigate.

Additional Product Resources

- CICS Transaction Server Support Web page:
  http://www.ibm.com/software/htp/cics/tserver/support/
- IBM Education Assistant modules:
  http://publib.boulder.ibm.com/infocenter/ieduasst/stgv1r0/index.jsp
- Webcasts for CICS and OMEGAMON:
  http://www.ibm.com/support/docview.wss?rs=1083&uid=swg27007244
- CICS Featured documents:
  http://www.ibm.com/support/docview.wss?rs=1083&uid=swg27006900
- Sign up to receive technical support emails:
  http://www.ibm.com/software/support/einfo.html

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Questions and Answers